

What is claimed and desired to be secured by United States Letters Patent is:

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1           1.     A system for accelerating delivery of digital objects of a global  
2 communications network, the system comprising:

3                 a central proxy server configured to transmit selected digital objects over a  
4 communication medium;

5                 a local proxy server configured to receive the selected digital objects from the  
6 central proxy server over the communication medium and to provide the selected  
7 digital objects to a caching database in local communication with the local proxy  
8 server in order to make the selected digital objects available to a plurality of user  
9 stations communicating with the caching database; and

10                a priority determination module operating within the local proxy server , the  
11 priority determination module configured to use both local priority data and global  
12 priority data in making a localized priority determination regarding digital objects  
13 stored in the caching database.

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15           2.     The system of claim 1, wherein the local proxy server is configured to utilize  
16 the localized priority determination to determine which digital objects transmitted by the  
17 central proxy server to store within the caching database.

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19           3.     The system of claim 1, wherein the local proxy server is configured to utilize  
20 the localized priority determination in selecting digital objects to discard.

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22           4.     The system of claim 1, further comprising a plurality of local proxy servers  
23 each configured to receive the selected digital objects from the central proxy server over the  
24 communication medium, each of the plurality of local proxy servers provided with a priority  
25 determination module configured to make a localized priority determination particular to the  
26 nature of the user stations of the central proxy server for which the priority determination  
module is provided.

1           5.       The system of claim 1, wherein the localized priority determination utilizes  
2 local demand data received from the caching database in making the localized priority  
3 determination.

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5           6.       The system of claim 1, wherein the priority determination module considers  
6 both local demand data received from the caching database and global demand data received  
7 from the central proxy server in making the localized priority determination.

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9           7.       The system of claim 1, wherein the local proxy server is configured to receive  
10 local demand data from the caching database and transmit the local demand data to the  
11 central proxy server.

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13           8.       The system of claim 7, wherein the local demand data comprises user requests  
14 for a particular digital object.

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16           9.       The system of claim 8, wherein the user requests comprise requests for a  
17 digital object located within the caching database of the local proxy server.

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19           10.      The system of claim 1, wherein the central proxy server is configured to  
20 receive local demand data from a plurality of local proxy servers, generate global demand  
21 data using the local demand information, and transmit the global demand data to at least one  
22 of the local proxy servers.

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24           11.      The system of claim 10, wherein the global demand data corresponding to a  
25 selected digital object is transmitted together with the selected digital object to the local  
26 proxy server.

1           12.     The system of claim 1, wherein the priority determination module is  
2 configured to account for types of subject matter that are of interest to users of the user  
3 stations communicating with the local proxy server in making the determination whether to  
4 discard the digital objects, and wherein the global demand data includes an indication of the  
5 type of subject matter of digital objects being transmitted from the central proxy server.  
6

7           13.     The system of claim 1, wherein the priority determination module is  
8 configured to employ a policy for assigning selected weights to particular types of digital  
9 objects in making the localized priority determination, the policy being unique to the local  
10 proxy server.  
11

12           14.     The system of claim 1, wherein the central proxy server is further configured  
13 to assign all selected digital objects a unique identifier code and to transmit a unique  
14 identifier code over the communication medium with each selected digital object.  
15

16           15.     The system of claim 14, wherein the central proxy server is further configured  
17 to generate a popularity rating for each transmitted digital object and to correlate the  
18 popularity rating with the corresponding unique identifier code for each transmitted digital  
19 object.  
20

21           16.     The system of claim 1, wherein the local proxy server is further configured  
22 to respond to a request from a communicating user station for a digital object available at a  
23 remote location on the global communication network by determining whether the  
24 information is present in the caching database and if the information is present, transmitting  
25 the requested information to the user station, and if the information is not present,  
26 transmitting a notification to the central proxy server that the information was requested by  
a user station.

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2 17. The system of claim 1, wherein the communication medium comprises an IP  
3 multicast system.

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5 18. The system of claim 1, wherein the communication medium comprises  
6 multicast distribution of the digital objects through geo-synchronous satellite transmission.

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8 19. The system of claim 1, wherein the local proxy server further comprises:  
9 a cache database management module operating within the caching database;  
10 and

11 a local caching module operating within the local proxy server and in integral  
12 communication with the cache database management module, the local caching  
13 module configured to receive notice that the selected digital objects have been  
14 received from the communication medium and instruct the cache database  
15 management module to store at least a portion of the selected digital objects within  
16 the caching database.

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18 20. The system of claim 19, further comprising an application program interface  
19 (API), the local caching module in communication with the cache database management  
20 module through the API.

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22 21. A method for accelerating delivery of digital content of a global  
23 communications network, the method comprising:

24 transmitting selected digital objects over a communication medium;

25 receiving the selected digital objects over the communication medium into  
26 a caching database of a local proxy server for later retrieval and transmission to user  
stations; and

1 making a determination whether to discard digital objects from the caching  
2 database and considering both local demand data from the caching database and  
3 global demand data from the central proxy server in making the determination.  
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5 22. A method for accelerating delivery of digital content of a global  
6 communications network, the method comprising:

7 extracting selected digital objects from a global communications network;

8 transmitting the selected digital objects over a communication medium;

9 receiving the selected digital objects over the communication medium into  
10 a caching database of a local proxy server for later retrieval and transmission to user  
11 stations;

12 integrally communicating with a cache database management module to store  
13 the selected digital objects in a caching database;

14 receiving a request from a user station for information available at a remote  
15 location on the global communications network;

16 making a determination whether to discard digital objects from the caching  
17 database and considering both local demand data received the caching database and  
18 global demand data from the central proxy server in making the determination; and

19 integrally communicating with the cache database management module to  
20 check for the information among the selected digital objects and making the  
21 information available for forwarding to the user station if present among the selected  
22 digital objects.  
23

24 23. A method for operating redundant proxy servers, the method comprising:

25 providing a plurality of redundant proxy servers, each redundant proxy server  
26 similarly configured;

providing a token to the redundant proxy servers;

1 selecting one of the redundant proxy servers as a master and a second as a  
2 backup;  
3 establishing a failure of communication with the master by the backup, and  
4 in response:  
5 incrementing the token within the backup,  
6 transmitting the backup's token to the client stations;  
7 the backup assuming operation as the master.

8  
9 24. A method for accelerating delivery of digital content of a global  
10 communications network, the method comprising:

11 transmitting a digital object over a communication medium from a central  
12 proxy server;  
13 receiving the digital object over the communication medium into a local  
14 proxy server;  
15 receiving notification from a local cache attendant to the local proxy server  
16 that the digital object is out of date;  
17 transmitting notice to the central proxy server that the object is out of date;  
18 retransmitting a newer version of the object from the central proxy server to  
19 the local proxy server.

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21 25. The method of claim 24, further comprising maintaining a transmission queue  
22 at the central proxy server with other digital objects to be transmitted to the local proxy  
23 server ordered in the queue, and the central proxy server receiving the transmitted notice that  
24 the object is out of date and in response, obtaining the newer version of the object and  
25 placing the newer version of the object in the queue with a higher priority than the object  
26 would have had absent the notice that the object is out of date.

1           26.    A method for accelerating delivery of digital content of a global  
2 communications network, the method comprising:

3                   transmitting a digital object over a communication medium from a central  
4 proxy server;

5                   receiving the digital object over the communication medium into a caching  
6 database of a local proxy server for possible later retrieval and transmission to user  
7 stations; and

8                   making a determination whether to retain the digital object within the caching  
9 database, making the determination comprising considering both quantitative and  
10 qualitative information about the object.

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12           27.    The method of claim 26, wherein the qualitative information comprises  
13 statistics about the nature of objects discarded from the caching database.

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15           28.    The method of claim 27, further comprising gathering the statistics about the  
16 nature of objects discarded from the caching database locally within the local proxy server.